



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/581,933

06/06/2006

Masahiro Watanabe

12336/10:1

1816

3528 7590 01/25/2008
STOEL RIVES LLP
900 SW FIFTH AVENUE
SUITE 2600
PORTLAND, OR 97204-1268

EXAMINER

LISTVOYB, GREGORY

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

01/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,933	WATANABE ET AL.	
	Examiner	Art Unit	
	Gregory Listvoyb	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 22-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 22-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/07/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Cancellation of non-elected claims 8-21 is acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1- 2, 7, 25-32 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "may" fails to particularly point out and distinctly claim the invention, since one cannot determine from the phrase the structural elements of the resin.

In addition, Claims 1 and 2 are not in compliance with MPEP 706.03, since they contain more than one sentence.

Claims 7 and 25-32 claim polyamides with average molecular weight not less than 5000. The term " average molecular weight" is indefinite, since it is not clear, what type (i.e. number or weight or Mn or Mw) of molecular weight is claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 22, 26, 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Parish (US 5302652) in combination with Kuromatsu et al (JP2002-105200, cited in the Office Action filed on 08.08.2007) herein Kuromatsu or Yin et al (Novel sulfoalkylated polyimide membrane for polymer electrolyte fuel cell, Chemistry letters, Vol 32, N4(2002), pp 328-329) herein Yin.

Parish discloses a conductive polyimide based on ODPA(4,4 oxydiphthalic anhydride) and 50% mol APB (1,3 bis (4-aminophenoxy) benzene) and 50%mol HMD (hexamethylene diamine), see Table IV, entry 9). The conductivity achieves with adding carbon particles (see Column 6, line 15). The above material is capable to form a film and have high Tg values. In addition, polyimides, produced with the same synthesis method have intrinsic viscosity values between 1.02 and 1.45 dl/g. Therefore, both Mw and Mn values are higher than 5000.

Parish does not disclose any charged groups in his polyimide (i.e. sulfonic, alkoxy sulfonic, etc).

Kuromatsu or Yin disclose conductive polyimides comprising 2,2'bis (3-sulfopropoxy) benzidine (BSPB) (see Kuromatsu, line 0026, Yin , Abstract) and 1, 4,5, 8 naphthalenetetracarboxylic acid dianhydride (NTDA) (see Yin, Abstract), which are the same polyimide ingredients used in the Application.

The advantage of having charged sulfonic groups in polyimide compare to polyimide with electro-active powder is that it provides system with improved storage stability (attached groups are not able to migrate, form clusters, etc.). Note that combination of carbon powder and attached sulfonic group can be also beneficial, since it can produce copolyimide with enhanced electrical and mechanical properties.

Therefore, it would have been obvious to a person of ordinary skills in the art to use BSPB with /or instead of carbon powder in Parish's compositions in order to enhance storage stability, mechanical and electrical properties of the polyimide composition.

Claims 6, 23-25, 30-32 rejected under 35 U.S.C. 103(a) as being unpatentable over Parish (US 5302652) in view of Kuromatsu or Yin and in further view of Lee et al (US 7157548, cited in the previous Office Action) herein Lee.

Parish discloses a conductive polyimide based on ODPA(4,4 oxydiphthalic anhydride) and 50% mol APB (1,3 bis (4-aminophenoxy) benzene) and 50%mol HMD

(hexamethylene diamine), see Table IV, entry 9). The conductivity achieves with adding carbon particles (see Column 6, line 15). The above material is capable to form a film and have high Tg values. In addition, polyimides, produced with the same synthesis method have intrinsic viscosity values between 1.02 and 1.45 dl/g. Therefore, both Mw and Mn values are higher than 5000.

Kuromatsu or Yin disclose conductive polyimides comprising 2,2'bis (3-sulfopropoxy) benzidine (BSPB) (see Kuromatsu, line 0026 , Yin , Abstract) and 1,4,5,8 naphthalenetetracarboxylic acid dianhydride (NTDA) (see Yin, Abstract), which are the same polyimide ingredients used in the Application.

Parish and Kuromatsu or Yin do not disclose a cross-linking polyimide.

Lee discloses a proton-conductive polyimide for fuel cell applications, which has cross-linking moieties in the main chain (see Abstract) and molecular weight of 100000-100000 (see line 0076).

It would have been obvious to a person of ordinary skills in the art at the time the invention was made that conductive polyimide can have crosslinking moieties in its structure in order to increase material stability to degradation and its mechanical properties.

Response to Arguments

Applicant's arguments, see Remarks, filed on 11/07/2007, with respect to the rejection(s) of claim(s) 1-7 and 22-32, under 35 U.S.C. 102(b) and 103(a) have been fully considered and are persuasive. Rejection was based on Asano, which is disqualified due to perfection of Foreign Priority Document). Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Parish, Kuromatsu or Yin and in further view of Lee.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory Listvoyb whose telephone number is (571) 272-6105. The examiner can normally be reached on 10am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Application/Control Number:
10/581,933
Art Unit: 1796

Page 7

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gregory Listvoyb
Examiner
Art Unit 1796

GL


RABON SERGENT
PRIMARY EXAMINER

Application/Control Number:
10/581,933
Art Unit: 1796

Page 8